

Figure 7 is a diagram of a software-based signal processor that forms part of an audio-to-vibrotactile converter shown in Figure 2.

Figure 8 is a diagram of a speech encoding algorithm module that forms part of the software-based signal processor shown in Figure 7.

Figure 9 is a diagram of an electro-mechanical actuator that forms part of a vibrotactile actuator shown in Figure 2.

Figure 10 is a diagram of an acoustic actuator that forms part of a vibrotactile actuator shown in Figure 2.

Figure 11 is a diagram of another embodiment of a mobile phone in a telecommunications network that is the subject matter of the present invention.

Figure 12 is a diagram of a personalized hearing parameters module of an audio-to-vibrotactile converter shown in Figure 11.

#### DETAILED DESCRIPTION OF INVENTION

##### Figure 1: Mobile Phone

Figure 1 shows a mobile phone generally indicated as 10 for use in connection with a telecommunication network generally indicated as 12. The scope of the invention is also intended to cover other user equipment and mobile electronic devices, such as a portable computer.

~~The mobile phone 10 includes a <sup>processor 13</sup> signal processor 12 connected to a radio access network module 14 having an~~